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Spring 2020

## CE 414-102: Engineered Construction

Chrissa Roessner

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New Jersey Institute of Technology  
John A. Reif Department of Civil & Environmental Engineering

CE 414 – Engineered Construction  
Section 102  
Colton Hall 416, Thursdays, 6:00 PM to 8:50 PM

Spring 2020  
Chrissa Roessner, PE (Adj Prof)  
[cdr44@njit.edu](mailto:cdr44@njit.edu)

Prerequisites: **CE 210**, **CE 332**, **CE 341**. Design, erection, and maintenance of temporary structures and procedures used to construct an engineering project. Business practices, codes, design philosophies, construction methods, hardware, inspection, safety, and cost as they pertain to engineered construction projects.

“Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at:

<http://www5.njit.edu/policies/sites/policies/files/academicintegritycode.pdf>.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at [dos@njit.edu](mailto:dos@njit.edu).”

Meeting Date	Topic
01/23/2020	Introductions Business & Legal Aspects of Construction
01/30/2020	Loads on Temporary Structures
02/06/2020	Forms & Formwork Part I (Walls)
02/13/2020	Forms & Formwork Part II (Walls)
02/20/2020	Forms & Formwork Part III (Slabs)
02/27/2020	Quiz No. 1
03/05/2020	Coffer Dams & Dewatering <i>Midterm Review</i>
03/12/2020	Midterm Exam
03/19/2020	*No Class* - Spring Break
03/26/2020	Sheet Piles and Soldier Piles Slopes, Excavations & Walls
04/02/2020	Construction Equipment & Safety
04/09/2020	Highway & Bridge Engineering
04/16/2020	Shotcrete Presentation: Guest Speaker
04/23/2020	Scaffolding & Shoring Quiz No. 2
04/30/2020	Underpinning
05/07/2020	*No Class* - Reading Day
05/14/2020	Final Exam

Attendance Policy

Students are expected to attend every class, and it is worth 10% of the total grade. Absences on quiz or exam dates are not preferred, but if absolutely necessary, please notify by email to discuss make-up arrangements.

### Office Hours

By Appointment (generally 5:00 pm – 6:00 pm Thursdays and Fridays)

### Homework

Students are responsible for submitting all homework assignments on engineering computation paper (completely and legibly) on or before the due date. Late assignments are unacceptable. Homework received after the due date will NOT receive credit, or will receive drastically lower credit than full. All assignments are to be submitted in class on paper, unless otherwise requested, on the due date, or via email to [cdr44@njit.edu](mailto:cdr44@njit.edu) *on or before* the beginning of class on the due date. Email is only to be used if you will be absent from class.

### Text

Robert T. Ratay. Temporary Structures in Construction. 3rd Edition. ISBN: 0-07-175307-9 (optional)

Chris Souder. Temporary Structure Design. ISBN: 978-1-118-90558-6 (optional)

### Grading

#### Breakdown

Attendance	10%
Homework	15%
Quiz #1	10%
Quiz #2	10%
Midterm	35%
Final	20%

#### Scale

A	100-90
B+	89-85
B	84-80
C+	79-75
C	74-70
D	69-60
F	Below 60

### **Course Objectives Matrix – CE 414 – Engineered Construction**

Strategies, Actions and Assignments	ABET Student Outcomes (1-7)	Program Educational Objectives	Assessment Measures
Student Learning Outcome 1: Determine loading on temporary construction structure			
Review loading, live load, dead load, concrete, soil, water	1, 2	1	Homework and exam
Student Learning Outcome 2: Design excavation support			
Determine earth pressure and loading for various soil conditions	1, 2	1	Homework and exam
Design support member sheeting and shoving	1, 2	1	Homework and exam
Student Learning Outcome 3: Discuss and Review construction safety for temporary structure			
Review OSHA 1926	4, 7	1	Class Review and Discussion, Homework, Exam

### **CEE Mission, Program Educational Objectives and Student Outcomes**

The mission of the Department of Civil and Environmental Engineering is:

- to educate a diverse student body to be employed in the engineering profession
- to encourage research and scholarship among our faculty and students
- to promote service to the engineering profession and society

Our program educational objectives are reflected in the achievements of our recent alumni:

1. **Engineering Practice:** Alumni will successfully engage in the practice of civil engineering within industry, government, and private practice, working toward sustainable solutions in a wide array of technical specialties including construction, environmental, geotechnical, structural, transportation, and water resources.
2. **Professional Growth:** Alumni will advance their skills through professional growth and development activities such as graduate study in engineering, research and development, professional registration and continuing education; some graduates will transition into other professional fields such as business and law through further education.
3. **Service:** Alumni will perform service to society and the engineering profession through membership and participation in professional societies, government, educational institutions, civic organizations, charitable giving and other humanitarian endeavors.

Our Student Outcomes are what students are expected to know and be able to do by the time of their graduation:

1. An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Revised: 11/29/19